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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : <b>A61N 1/375</b>	<b>A3</b>	(11) International Publication Number: <b>WO 97/38752</b> (43) International Publication Date: 23 October 1997 (23.10.97)
(21) International Application Number: <b>PCT/US97/06213</b> (22) International Filing Date: 14 April 1997 (14.04.97) (30) Priority Data: 08/632,730 15 April 1996 (15.04.96) <b>US</b> (71) Applicant: <b>MEDTRONIC, INC.</b> [US/US]; 7000 Central Avenue Northeast, Minneapolis, MN 55432 (US). (72) Inventors: <b>HASSLER, Beth, Anne</b> ; 3300 Adair Avenue North, Crystal, MN 55422 (US). <b>DONDERS, Adrianus, P.</b> ; 15089 Craine Street Northwest, Andover, MN 55304 (US). <b>WIKLUND, Craig, L.</b> ; 9943 Wentworth Avenue South, Bloomington, MN 55420 (US). <b>LYONS, Daniel, A.</b> ; 3908 Dellview Avenue, Arden Hills, MN 55112 (US). (74) Agents: <b>ATLASS, Michael, B. et al.</b> ; Medtronic, Inc., 7000 Central Avenue Northeast, MS301, Minneapolis, MN 55432 (US).		(81) Designated States: AU, CA, JP, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>  (88) Date of publication of the international search report: 5 March 1998 (05.03.98)
(54) Title: <b>MEDICAL IMPLANTABLE CERAMIC DEVICE</b>		
(57) Abstract  An implantable medical device with a ceramic enclosure has a novel multi-layered ceramic feedthrough substrate in place of a prior art glass-to-metal feedthrough substrate, leading to lower costs and a higher feedthrough density. Use in a metal enclosure is also disclosed.		
<p>The diagram shows a perspective view of a medical implantable ceramic device. The main component is a large, oval-shaped ceramic enclosure (100). Along one edge of this enclosure, there is a series of feedthroughs (106). A multi-layered ceramic feedthrough substrate (102) is shown attached to the enclosure, with a metal enclosure (104) partially visible. Other components labeled include 103, 108, and 110.</p>		

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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 97/06213

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 A61N1/375

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 A61N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 470 345 A (HASSLER) 28 November 1995 see abstract see column 2, line 26 - column 3, line 41 ---	1-4
A	GB 2 134 335 A (COMMONWEALTH OF AUSTRALIA) 8 August 1984 see abstract; claim 1 ---	1
A	WO 94 08539 A (COCHLEAR PTY) 28 April 1994 see abstract; claim 1 see page 3, line 1 - line 8 ---	1
A	US 4 785 827 A (FISCHER) 22 November 1988 cited in the application see column 3, line 45 - column 4, line 25; claim 1 --- -/--	1

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- \*G\* document member of the same patent family

Date of the actual completion of the international search

30 December 1997

Date of mailing of the international search report

23.01.98

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 97/06213

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 991 582 A (BYERS) 12 February 1991 cited in the application see abstract see page 5, line 55 - line 58 ---	1
A	US 4 518 820 A (KYLE)  see abstract ---	5,8-10, 16,17,19
A	EP 0 269 007 A (SIEMENS)  see abstract ---	5,8-10, 16,17,19
A	EP 0 776 016 A (MAXWELL LABORATORIES)  see abstract ---	5,8-10, 16,17,19
P,A	WO 97 20332 A (MAXWELL LABORATORIES)  see abstract ---	5,8-10, 16,17,19
P,A	WO 97 38752 A (MEDTRONIC)  see abstract -----	5,8-10, 16,17,19

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 97/06213

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 97/06213

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a):

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This International Searching Authority found multiple inventions in this international application, as follows:

SUBJECT 1: Claims 1-4  
SUBJECT 2: Claims 5-11  
SUBJECT 3: Claims 17-19

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 97/06213

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